EXECUTIVE SUMMARY

Section 10 of Engrossed Substitute House Bill 2496 (Salmon Recovery Act of 1998), directs the Washington State Conservation Commission, in consultation with local government and treaty tribes to invite private, federal, state, tribal, and local government personnel with appropriate expertise to convene as a Technical Advisory Group (TAG). The purpose of the TAG is to identify limiting factors for salmonids. Limiting factors are defined as "conditions that limit the ability of habitat to fully sustain populations of salmon, including all species of the family Salmonidae." It is important to note that the charge to the Conservation Commission in ESHB 2496 does not constitute a full limiting factors analysis. A full habitat limiting factors analysis would require extensive additional scientific studies for each of the subwatersheds in East Water Resource Inventory Area (WRIA) 15 (see location in Figure 1). Analysis of hatchery, hydro, and harvest impacts would also be part of a comprehensive limiting factors analysis, but these elements will be considered in other forums.

East WRIA 15 includes the streams and marine waters on the Puget Sound side of Key Peninsula, Gig Harbor Peninsula, South Puget Sound Islands, and Kitsap Peninsula. There are numerous low-elevation, low-gradient streams throughout East WRIA 15. There are 125 separate streams entering saltwater in East WRIA 15 that are known to support salmonids, with an estimated 215 miles of known anadromous salmonid utilization. Total length of utilized habitat rivals that of most large river basins, and the production potential of the streams is very high due to the low-gradient nature of the streams, the lack of natural anadromous fish passage barriers, and the extensive wetland complexes in many of the drainages. Individual drainage lengths range from single channels less than 1 mile in length to larger drainages with numerous tributaries (the Chico Creek watershed includes almost 68 miles of streams and tributaries, of which approximately 17 miles are accessible to anadromous salmonids (PSCRBT 1989)). Although the upper portions of some watersheds may not be accessible to anadromous salmonids, many support resident salmonid populations, and all warrant protection as "critical contributing areas" to downstream salmonid habitat (water quantity and quality). The larger drainages in East WRIA 15 include Coulter Creek, Rocky Creek, Minter Creek, Burley Creek, Crescent Creek, Curley Creek, Blackjack Creek, Gorst Creek, Chico Creek, Clear Creek, Dogfish Creek, and Grovers Creek. Most of the streams in East WRIA 15 are low gradient and highly productive, particularly for chum, coho, and cutthroat. In addition, there are 320 miles of marine shoreline and nearshore habitat in East WRIA 15, which provide juvenile rearing and migration habitat for local salmonid stocks as well as stocks originating from other Puget Sound WRIAs, and spawning habitat for baitfish stocks.

The soils throughout much of East WRIA 15 are comprised of a thin veneer of pervious topsoil over a deep deposit of densely compacted glacial till. This allows precipitation to be retained, held in wetlands, and naturally metered out to the streams to provide surface flows even through the dry summer months. The wetlands also provide excellent rearing habitat for juvenile coho salmon and cutthroat trout. Many streams do not have year-round surface flows, but provide excellent spawning and rearing habitat for chum salmon, which are only present during the wet winter months. The retention of natural stream hydrology is imperative to maintaining suitable habitat for salmonids.

WRIA 15 is quite unique in comparison to other western Washington watersheds. As noted above, the entirety of the WRIA is low-elevation and low-gradient. The drainages are relatively

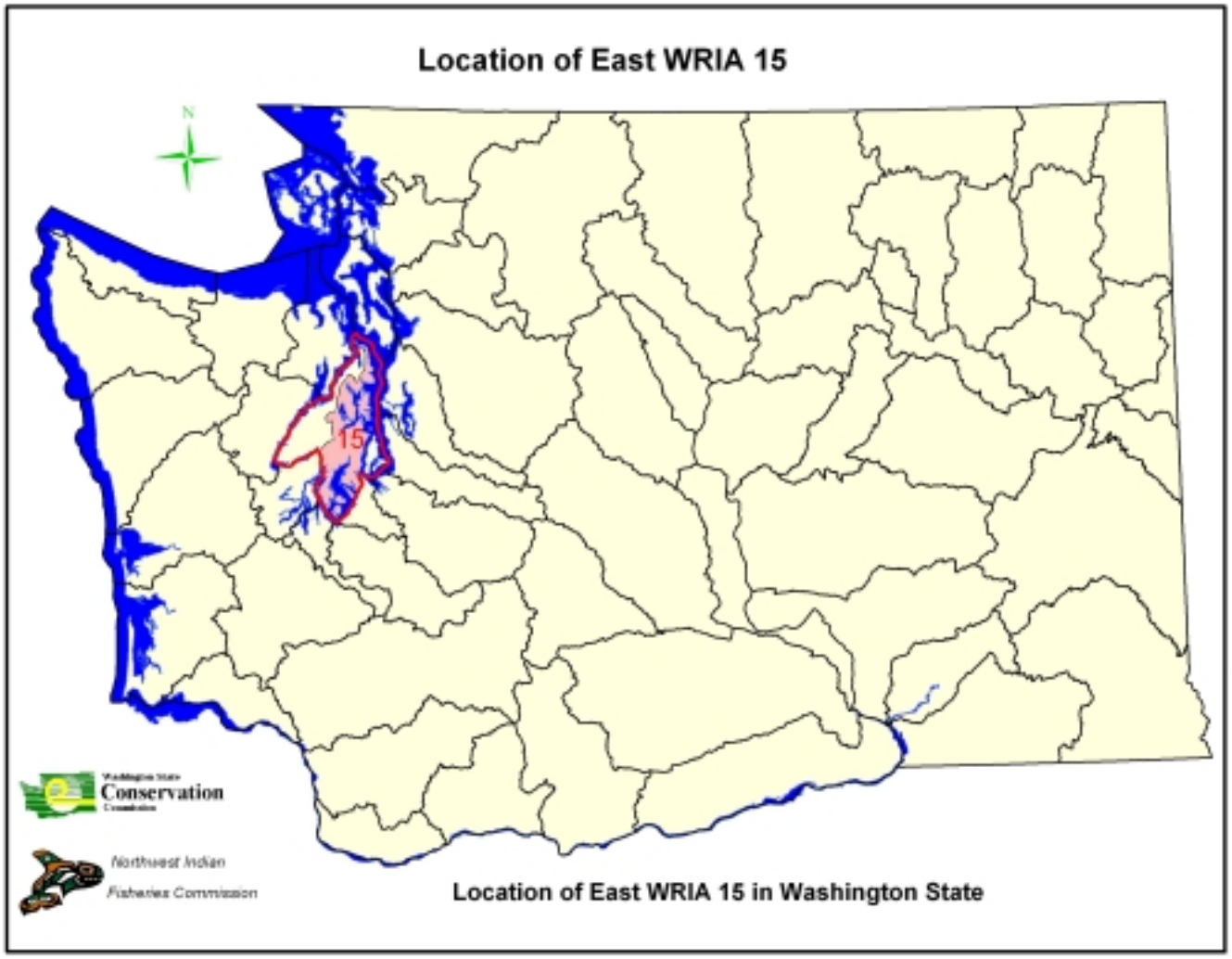

Figure 1: Location of East WRIA 15 in Washington State

small in comparison to larger river systems, and flows are dependent on precipitation and groundwater contribution, as the drainages do not receive snowmelt runoff from either the Olympic or Cascade mountains. Low-elevation snowmelt or rain-on-snow events during winter months are infrequent, and of much lower magnitude than events in the larger river systems that originate in the mountains. As a result, the natural hydrology and salmonid habitat conditions in streams in undisturbed areas tend to be very stable. However, the salmonid habitat in the streams in East WRIA 15 appears to be highly susceptible to changes in hydrology resulting from stormwater runoff from development in the watersheds. The increase in impervious surfaces, associated with conversion of forestland to residential and commercial development, decreases the infiltration of precipitation into the soils and wetlands, and increases the frequency and magnitude of peak stream flows. The result is less water being available to sustain flows through the dry months, and the increased peak flows result in increased bank and streambed instability, channel scour and downcutting, and loss of instream habitat diversity, all of which adversely affect salmonid production.

This report addresses habitat conditions that support anadromous salmon and steelhead, based on the stock status designations identified in the Salmon and Steelhead Stock Inventory (SASSI (WDF et al. 1993)). In addition, cutthroat trout utilization is identified where known and presumed elsewhere to the upper extent of other known salmonid utilization. There is no known bulltrout (char) presence in the low elevation streams or marine areas of East WRIA 15, however little sampling for bulltrout has occurred in marine areas. This report attempts to compile the best available information on the current distribution and condition of salmonid stocks, for use in determining potential benefits of salmonid habitat protection and restoration efforts.
Table 1 provides a summary of salmon stocks identified in SASSI, identified SASSI stock status, and ESA listing status. Distributions of individual salmon and steelhead species are shown on the maps in the separate Maps appendix included with this report, with supporting tabular data in Appendix A.

Data included in this report include formal habitat inventories or studies specifically directed at evaluating fish habitat, other watershed data not specifically associated with fish habitat evaluation, and personal experience and observations of the watershed experts involved in the TAG. These data provide an analysis of the salmonid habitat limiting factors in East WRIA 15. Although many of the habitat data/observations in this report may not meet the highest scientific standard of peer reviewed literature, they should nevertheless be considered as valid, as they are based on the collective experience of the watershed experts that are actively working in these freshwater drainages and marine nearshore habitats. Although there are a significant number of past studies and reports on these watersheds, a large number of salmonid habitat “data gaps” remain, which will require additional specific watershed research or evaluation. The available data indicate several common habitat themes across watersheds within East WRIA 15, including:

- natural stream ecological processes have been significantly altered due to adjacent land management practices and direct actions within the stream corridor,
- substantial increases in peak flow frequency and magnitude due to channelization and increased stormwater runoff from lands that have been converted to non-forest status; many of the less developed streams are facing similar threats from growth and further conversion of forestland to non-forest status,
- salmonid habitat quality and quantity has been adversely impacted by the cumulative effects of poor agricultural practices, timber harvest that exceeds sustainable levels,
- insufficient erosion controls during construction operations, and ineffective stormwater controls (water quality and quantity),

Table 1: East WRIA 15 Salmon and Steelhead Stock Designations and Associated Status

Stock	**SASSI Status**	**ESA Listing Status**
South Sound Tribs. Summer/Fall Chinook	Healthy	Threatened
Case Inlet Summer Chum	Healthy	Not Warranted
Blackjack Creek Summer Chum	Healthy	Not Warranted
Case Inlet Fall Chum	Healthy	Not Warranted
Carr Inlet Fall Chum	Healthy	Not Warranted
Gig Harbor/Olalla Fall Chum	Healthy	Not Warranted
Dyes Inlet/Liberty Bay Fall Chum	Healthy	Not Warranted
Sinclair Inlet Fall Chum	Healthy	Not Warranted
Port Madison/Foulweather Bluff Fall Chum	Not Identified as Distinct Stock	Not Warranted
Bainbridge Island Fall Chum	Not Identified as Distinct Stock	Not Warranted
Deep South Sound Tribs. Coho	Healthy	Candidate
East Kitsap Coho	Healthy	Candidate
Bainbridge Island Coho	Not Identified as Distinct Stock	Candidate
Case/Carr Inlets Winter Steelhead	Unknown	Not Warranted
East Kitsap Winter Steelhead	Unknown	Not Warranted
Western South Sound Coastal Cutthroat	Unknown	Not Warranted
East Kitsap/Bainbridge Coastal Cutthroat	Not Identified as Distinct Stock	Not Warranted

- loss/impairment of instream flows during dry periods due to degradation and loss of headwater and floodplain wetlands, that store water during wet periods and meter flows to the streams during dry periods,
- substrate sediment stability and composition has been affected in a number of freshwater drainages due to lack of effective stormwater runoff controls,
- fine sediment (<.85 mm) levels in the gravels of several streams are identified as likely being high enough to adversely affect spawning success and benthic invertebrate production,
- lack of adequate large woody debris (LWD) in streams, particularly larger key pieces that are critical to developing pools, log jams, and other habitat diversity important to salmonids,
- lack of adequate pool frequency, or large deep pools that are important to rearing juvenile salmonids and adult salmonids on their upstream migration,
- loss of natural floodplain processes, due to dredging, bank armoring, and channelization, including the loss of functional off-channel habitat,

- loss of freshwater riparian function due to removal/alteration of natural riparian vegetation, which affects water quality, lateral erosion, bank stability, instream habitat conditions, LWD recruitment, etc.,
- the presence of a large number of culverts/screens/dams/etc. that preclude unrestricted upstream or downstream access to juvenile and adult salmonids,
- estuarine/marine nearshore function is substantially impacted by physical alteration of natural estuaries, by alteration of nearshore ecological function due to extensive shoreline armoring, by loss of shoreline LWD, by loss of shoreline riparian shade, and by poor water/sediment quality

Although there are varying extents of habitat impacts throughout East WRIA 15, the freshwater and marine nearshore salmonid habitat conditions are generally better in the northern and southern portions of East WRIA 15 than in the more heavily developed central portion. This does not appear to be the result of better land use regulation differences between Kitsap and Pierce counties, but rather the result of greater development interest and pressure in southern Kitsap County than in Pierce County or northern Kitsap County. However, the entirety of East WRIA 15 is experiencing rapid population growth, and all freshwater and marine nearshore salmonid habitats are at risk of adverse impacts.

Prioritized habitat action recommendations are provided for each stream in which salmonid presence has been identified, and for each marine area, following the discussion of identified salmonid habitat concerns. Those action recommendations at the top of the list are considered to provide greater restoration potential than those towards the bottom of the list, or those on the top of the list may need to be done first to better ensure the effectiveness of those further down the list. The TAG discussed at length whether it was practicable to prioritize or rank streams in East WRIA 15 on the basis of salmonid productivity potential resulting from habitat restoration. They determined that prioritization/ranking of streams was not feasible and may preclude consideration of high benefit restoration projects in certain watersheds. The TAG consensus was that proposed habitat restoration projects should be reviewed on their own merits, and the projects prioritized/ranked on the basis of their anticipated benefit to protecting/restoring salmonid production. Habitat protection/restoration project proposal ranking should consider whether the project addresses an identified habitat limiting factor, where the project type ranks in the prioritized action recommendations list for that stream or marine area, how the project complements other protection/restoration actions, and how the project complements with identified habitats needing protection (e.g., CTC 2000). Project ranking should also consider projects where willing landowners and partnerships can increase the effectiveness/efficiency of the restoration project. Habitat conditions also vary between different reaches of a stream; restoration proposals should consider the potential benefits of the proposal in relation to habitat conditions likely to be encountered elsewhere in the stream. In addition, restoration of the marine nearshore should be considered a high priority, based on benefits to all salmonid stocks including stocks originating outside East WRIA 15.

Protection/restoration of salmonid resources cannot be accomplished by watershed restoration projects alone. It is unlikely that we will be able to resolve the salmon predicament using the same land management approaches that got us into it. We will need to look at the watershed with a clear new vision. Salmonid recovery will require a combination of efforts, including:

- improved resource stewardship by landowners; regulations alone will not be effective without landowner commitment to resource protection and stewardship

- revision, implementation, and enforcement of land use ordinances that provide protection for natural ecological processes in the marine, instream, and riparian corridors, including measures to limit impervious surfaces to levels, and in a manner, that will maintain natural hydrology,
- protection of marine, instream, and riparian habitat that is currently functioning, particularly key habitat areas, and
- restoration of natural marine, instream, and riparian ecological processes where they have been impaired.

This report provides information that can and should be used in the development of salmonid habitat protection and restoration strategies. It should be considered a living document, with additional habitat assessment data and habitat restoration successes incorporated as information becomes available.